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(54) Process for decorating objects with enamelled surfaces

(57) A process for decorating, marking, engraving or the like of objects with enamelled surfaces by means of laser beams, wherein the enamel or enamel raw materials are mixed with turbidity agents which, due to the action of a laser beam, initiate chemical and physical reactions locally and optically and thereby bring about a colour change.

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to be marked with the markings of the manufacturer, as well as with operating instructions. According to the present invention, this takes place in the following way:

5 The basic enamelling is first carried out in conventional manner. Subsequently, by spraying, there is applied a covering enamel which contains 20% of melted-in titanium dioxide. After drying, there then follows the desired lettering of the object with a
 10 carbon dioxide or YAG laser according to a predetermined programme. Thereafter, there is carried out the stoving-in of the object at a stoving temperature usual for the enamel.

15 *Example 3*

A sheet steel utensil is base and cover enamelled in a conventional manner, the covering enamel thereby containing a turbidity agent according to the present invention. The enamelled object is then
 20 decorated by means of a laser beam in the manner already described in Examples 1 and 2. On to the decorated object is now applied a coloured, transparent enamel in the form of a majolica enamel which is then dried and stoved. There is thereby obtained
 25 an enamelled utensil with a beautiful decoration in which the contours imparted by the laser beam appear through the majolica enamel.

CLAIMS

30 1. Process for decorating, marking, engraving or the like of objects with enamelled surfaces by means of laser beams, wherein the enamel or enamel raw materials are mixed with turbidity agents which, due
 35 to the action of a laser beam, initiate chemical and physical reactions locally and optically and thereby bring about a colour change.
 2. Process according to claim 1, wherein the turbidity agent is an oxide of titanium, tin, cerium or
 40 antimony.
 3. Process according to claim 1 or 2, wherein the irradiation is carried out by means of a laser either in the case of stoved-in or in the case of non-stoved enamel surface layers.
 45 4. Process according to claim 1 or 2, wherein the irradiation is carried out when the enamel surface is still hot or plastic.
 5. Process according to any of the preceding claims, wherein the surface treated by the laser or
 50 the whole of the object is subjected to a further heat treatment.
 6. Process according to any of the preceding claims, wherein the surface of the object treated by means of a laser is provided with a further layer of
 55 transparent, cloudy, non-cloudy or coloured enamel.
 7. Process according to any of the preceding claims, wherein the surface is covered during the laser irradiation by an absorbent material which is impregnated with a flux, lustre or strongly colouring
 60 salt solution.
 8. Process according to claim 1 for decorating, marking, engraving or the like of objects with enamelled surfaces, substantially as hereinbefore described and exemplified.
 65 9. Objects which have been decorated, marked,

engraved or the like by the process according to any of claims 1 to 8.

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